AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

1. (Currently Amended) A method of load monitoring comprising:

generating a current state model that defines loads positioned on a load storage device;

maintaining an item database that includes a definition of one or more items potentially included in a load positioned upon the load storage device, wherein the definition of each item includes one or more parameters that define the item;

monitoring ~~an~~ initial state load signals ~~output signal~~ generated by ~~one or more~~ a plurality of load sensors positioned about ~~a~~ the load storage device;

monitoring ~~a~~ current state load signals ~~output signal~~ generated by the ~~one or more~~ plurality of load sensors;

comparing the initial and current state ~~output~~ load signals to determine a ~~load~~ change in load on the load storage device; ~~and~~

determining an identity of an item corresponding to the change based on the item database ~~associated with the load storage device from a plurality of items potentially included in a load positioned upon the load storage device based on the load change and a pre-stored load associated with the item~~, wherein the determining is executed by a processor that uses the load change as an input;

determining a position of the load relative to a surface of the load storage device in three dimensions based on the load signals; and

generating an updated current state model by modifying the current state model based on the position and the identity.

2. (Original) The method of claim 1 comprising establishing an empty state model for the load storage device during an empty state in which the load storage device does not contain any load.

3. (Currently Amended) The method of claim 2 further comprising:

modifying the empty state model to generate ~~a~~ the current state model pursuant to changes in the load positioned upon the load storage device,

wherein the current state model defines the load positioned upon the load storage device during a loaded state.

4. (Previously Presented) The method of claim 3 further comprising:

maintaining an item database that includes a definition for each of the plurality of items potentially included in the load positioned upon the load storage device,

wherein the definition of each item includes one or more parameters that define the item.

5. (Original) The method of claim 4 wherein the one or more parameters are chosen from the group consisting of: item name, item part number, product quantity per item, item weight, item height, item width, and item depth.

6. (Previously Presented) The method of claim 3 wherein modifying the empty state model includes adding one or more items to the empty state model.

7. (Cancelled)

8. (Currently Amended) The method of claim 1 ~~7~~ wherein updating the current state model includes adding or removing one or more items to or from the current state model.

9. (Currently Amended) The method of claim 5 wherein comparing the initial and current state load ~~output~~ signals includes determining a net load change in the load positioned upon the load storage device.

10. (Currently Amended) The method of claim 9 wherein comparing the initial and current state load ~~output~~ signals further includes comparing the determined net load change to the item weight of one or more of the plurality of items potentially included in the load.

11. (Cancelled)

12. (Previously Presented) The method of claim 1 further comprising updating a state model to include the item.

13. (Currently Amended) The method of claim 1 further comprising ~~establishing a~~ generating the current state model for the load storage device during a loaded state of the load storage device.

14. (Cancelled)

15. (Original) The method of claim 1 further comprising positioning the load sensors about the load storage device.

16. (Original) The method of claim 15 wherein the load storage device is generally rectangular in shape and positioning the load sensors includes positioning one load sensor proximate each corner of the load storage device.

17. (Original) The method of claim 15 wherein positioning the load sensors includes positioning one or more of the load sensors between the load storage device and the surface upon which the load storage device rests.

18. (Original) The method of claim 1 wherein the load storage device is chosen from a group consisting of: a pallet; a shelf; a table, a bin, and a shipping container.

19. (Previously Presented) The method of claim 1 wherein the initial state is an empty state or a loaded state.

20. (Previously Presented) The method of claim 1 wherein the current state is an empty state or a loaded state.

21. (Currently Amended) A computer program product residing on a computer readable medium having a plurality of instructions stored thereon which, when executed by the processor, cause that processor to:

generate a current state model that defines loads positioned on a load storage device;

maintain an item database that includes a definition of one or more items potentially included in a load positioned upon the load storage device, wherein the definition of each item includes one or more parameters that define the item;

monitor ~~an~~ initial state load signals ~~output signal~~ generated by ~~one or more~~ a plurality of load sensors positioned about ~~a~~ the load storage device;

monitor ~~a~~ current state load signals ~~output signal~~ generated by the ~~one or more~~ plurality of load sensors;

compare the initial and current state load ~~output~~ signals to determine a ~~load~~ change in load on the load storage device; ~~and~~

determine an identity of an item corresponding to the change based on the item database ~~associated with the load storage device from a plurality of items potentially included in a load positioned upon the load storage device based on the load change and a pre-stored load associated with the item~~;

determine a position of the load relative to a surface of the load storage device in three dimensions based on the load signals; and

generate an updated current state model by modifying the current state model based on the position and the identity.

22. (Original) The computer program product of claim 21 further comprising instructions for establishing an empty state model for the load storage device during an empty state in which the load storage device does not contain any load.

23. (Currently Amended) The computer program product of claim 22 further comprising instructions for:

modifying the empty state model to generate a the current state model pursuant to changes in the load positioned upon the load storage device,

wherein the current state model defines the load positioned upon the load storage device during a loaded state.

24. (Cancelled)

25. (Currently Amended) The computer program product of claim 21 ~~24~~ wherein the instructions for modifying the empty state model include instructions for adding one or more items to the empty state model.

26. (Cancelled)

27. (Currently Amended) The computer program product of claim 21 wherein the instructions for comparing the initial and current state load ~~output~~ signals include instructions for determining a net load change in the load positioned upon the load storage device.

28. (Currently Amended) The computer program product of claim 27 wherein the instructions for comparing the initial and current state load ~~output~~ signals further include instructions for comparing the determined net load change to an item weight of one or more of the plurality items potentially included in the load.

29. (Cancelled)

30. (Currently Amended) The computer program product of claim 21 further comprising instructions for establishing the a current state model for the load storage device during a loaded state of the load storage device.

31. (Cancelled)

32. (Original) The computer program product of claim 21 wherein the initial state is an empty state or a loaded state.

33. (Original) The computer program product of claim 21 wherein the current state is an empty state or a loaded state.

34.-38 (Cancelled)

39. (New) A system for monitoring loads on a load storage device in a current state model that defines a load positioned upon the load storage device, the system comprising:

a plurality of load sensors positioned to measure a load on a load storage device and for outputting load signals corresponding to the load;

a database for storing a plurality of load records, each load record corresponding to an item type; and

a load monitoring system for receiving the load signals and for accessing the database, the load monitoring system including one or more processors operable to execute instructions comprising:

generating a current state model that defines loads positioned on a load storage device;

maintaining an item database that includes a definition of one or more items potentially included in a load positioned upon the load storage device, wherein the definition of each item includes one or more parameters that define the item;

monitoring initial state load signals generated by the plurality of load sensors positioned about the load storage device;

monitoring current state load signals generated by the plurality of load sensors;

comparing the initial and current state load signals to determine a change in load on the load storage device;

determining an identity of an item corresponding to the change based on the item database;

determining a position of the load relative to a surface of the load storage device in three dimensions based on the load signals; and

generating an updated current state model by modifying the current state model based on the position and the identity.

40. (New) The system of claim 39, wherein the instructions further comprise determining the position as a spatial location of the item, relative to the surface, based on load signals in directions of an X,Y plane, an X,Z plane, and a Y,Z plane, the determining comprising determining a number of load sensor positions that detected the change, and calculating a percentage of weight distribution detected on each load sensor position.

41. (New) The system of claim 39, wherein the instructions further comprise comparing the determined identity of the item with items stored in the item database to determine whether a definition record exists for the item.

42. (New) The system of claim 41, wherein the instructions further comprise:

updating the item database to include a definition record comprising description data for the item when the item does not exist in the item database; and

updating the item database to include the position of the item when the first item exists in the item database.

43. (New) The method of claim 1, wherein the position is determined as a spatial location of the item, relative to the surface, based on load signals in directions of an X,Y plane, an X,Z plane, and a Y,Z plane, the determining comprising determining a number of load sensor positions that detected the change, and calculating a percentage of weight distribution detected on each load sensor position.

44. (New) The method of claim 1, further comprising comparing the determined identity of the item with items stored in the item database to determine whether a definition record exists for the item.

45. (New) The method of claim 44, further comprising:

updating the item database to include a definition record comprising description data for the item when the item does not exist in the item database; and

updating the item database to include the position of the item when the first item exists in the item database.

46. (New) The computer program product of claim 21, wherein the instructions further cause the processor to determine the position as a spatial location of the item, relative to the surface, based on load signals in directions of an X,Y plane, an X,Z plane, and a Y,Z plane, the determining comprising determining a number of load sensor positions that detected the change, and calculating a percentage of weight distribution detected on each load sensor position.

47. (New) The computer program product of claim 21, wherein the instructions further cause the processor to compare the determined identity of the item with items stored in the item database to determine whether a definition record exists for the item.

48. (New) The computer program product of claim 47, wherein the instructions further cause the processor to:

update the item database to include a definition record comprising description data for the item when the item does not exist in the item database; and

update the item database to include the position of the item when the first item exists in the item database.